Štěpán Starosta

Curriculum Vitae

Contact

Email:	stepan.starosta@fit.cvut.cz	Adress:	ČVUT v Praze, FIT
Telephone:	+420 224 359 886		Thákurova 9
Mobile:			160 00 Praha 6
Web:	users.fit.cvut.cz/~staroste		Czech Republic

Personal information

Education

2008 - 2012 CTU in Prague, FNSPE, Department of Mathematics - PhD studies
specialization: Mathematical modelling
dissertation thesis: Generalized Palindromes in Infinite Words
advisor: prof. Ing. Edita Pelantová CSc.

2002 - 2008 CTU in Prague, FNSPE, Department of Mathematics - Master studies
specialization: Mathematical modelling
diploma thesis: Application of adaptive filtering in recognition of spoken Czech
advisor: Ing. Pavel Bolek

Employment

2011 – now *researcher* and *assistant professor* at FIT CTU in Prague

2004 – 2013 *programmer and consultant*

- functional design and implementation of web and mobile applications
- consultation of software solutions

Languages

English, French	advanced
Spanish	basics
Czech	first language

Research

Domains of interest

Combinatorics on words

Symbolic dynamical systems

Theoretical computer science

Number theory

`SageMath` - open source mathematics software

Publications published in peer reviewed journals

1. Ľ. Balková, E. Pelantová and Š. Starosta, *Palindromes in infinite ternary words*, RAIRO - Theoret. Inf. Appl. **43** (2009), 687–702, DOI: 10.1051/ita/2009016
2. Ľ. Balková, E. Pelantová and Š. Starosta, *Sturmian Jungle (or Garden?) on Multiliteral Alphabets*, RAIRO - Theoret. Inf. Appl. **44** (2010), 443–470, DOI: 10.1051/ita/2011002
3. Š. Starosta, *On Theta-palindromic Richness*, Theoret. Comp. Sci. **412** (2011), 1111–1121, DOI: 10.1016/j.tcs.2010.12.011
4. Ľ. Balková, E. Pelantová, Š. Starosta: *Infinite Words with Finite Defect*, Adv. in Appl. Math. **47** (2011), 562–574, DOI: 10.1016/j.aam.2010.11.006
5. Ľ. Balková, E. Pelantová, Š. Starosta: *On Brlek-Reutenauer Conjecture*, Theoret. Comp. Sci. **412** (2011), 5649–5655, DOI: 10.1016/j.tcs.2011.06.031
6. E. Pelantová and Š. Starosta: *Infinite words rich and almost rich in generalized palindromes*, in: G. Mauri, A. Leporati (Eds.), Developments in Language Theory, volume 6795 of Lecture Notes in Computer Science, Springer-Verlag, Berlin, Heidelberg, 2011, 406–416. DOI: 10.1007/978-3-642-22321-1_35
7. P. Arnoux and Š. Starosta, *Rauzy gasket*, in: J. Barral and S. Seuret (Eds.), Further Developments in Fractals and Related Fields, Trends in Mathematics, DOI 10.1007/978-0-8176-8400-6_1, Springer Science+Business Media New York 2013
8. E. Pelantová and Š. Starosta, *Almost rich words as morphic images of rich words*, International Journal of Foundations of Computer Science Vol. 23, No. 5 (2012), 1067–1083, World Scientific Publishing Company, DOI: 10.1142/S012905411240045X
9. Š. Starosta, *Generalized Thue-Morse words and palindromic richness*, Kybernetika 48 (2012), n. 3, 361–370
10. Ľ. Balková, E. Pelantová and Š. Starosta, *Proof of Brlek-Reutenauer conjecture*, Theoret. Comput. Sci. 475 (2013), 120–125, DOI: 10.1016/j.tcs.2012.12.024
    Ľ. Balková, E. Pelantová and Š. Starosta, *Corrigendum: "On Brlek-Reutenauer conjecture"*, Theoret. Comput. Sci. 465 (2012), 73–74

11. E. Pelantová and Š. Starosta: *Languages invariant under more symmetries: overlapping factors versus palindromic richness*, Discrete Math. 313 (2013), 2432–2445, DOI: 10.1016/j.disc.2013.07.002

12. E. Pelantová and Š. Starosta: *Palindromic richness for languages invariant under more symmetries*, Theoret. Comput. Sci. 518 (2014), 42–63, DOI: 10.1016/j.tcs.2013.07.021

13. T. Jajcayová, E. Pelantová, Š. Starosta: *Palindromic closures using multiple antimorphisms*, Theoret. Comput. Sci. 533 (2014), 37–45, DOI: 10.1016/j.tcs.2014.03.020

14. M. Kupsa, Š. Starosta: *On the partitions with Sturmian-like refinements and an application to factor mappings from Sturmian subshifts*, Discrete and Continuous Dynamical Systems - Series A, Volume 35, Issue 8, August 2015, 3483–3501, DOI: 10.3934/dcds.2015.35.3483

15. K. Klouda, Š. Starosta: *An Algorithm Enumerating All Infinite Repetitions in a DoL-System*, J. Discrete Algorithms 33 (2015), 130—138, DOI: 10.1016/j.jda.2015.03.006

16. Š. Starosta: *Morphic images of episturmian words having finite palindromic defect*, Eur. J. Combin. 51 (2016), 359—371, DOI: 10.1016/j.ejc.2015.07.001

17. Z. Masáková, E. Pelantová and Š. Starosta: *Interval Exchange Words and the Question of Hof, Knill, and Simon*, Developments in Language Theory, 2015, 377–388, DOI: 10.1007/978-3-319-21500-6_30

18. E. Pelantová, Š. Starosta, and M. Znojil: *Markov Constant and Quantum Instabilities*, Journal of Physics A: Mathematical and Theoretical 49 (2016), Number 15, DOI: 10.1088/1751-8113/49/15/155201

19. E. Pelantová and Š. Starosta: *Constructions of words rich in palindromes and pseudopalindromes*, Discrete Mathematics & Theoretical Computer Science, November 22, 2016, Vol. 18, no 3

20. Z. Masáková, E. Pelantová and Š. Starosta: *Itineraries induced by exchange of three intervals*, Acta Polytechnica, Vol. 56, No. 6 (2016)

21. S. Labbé, E. Pelantová and Š. Starosta: *On the Zero Defect Conjecture*, Eur. J. Combin. 62 (2017), 132-146, DOI: 10.1016/j.ejc.2016.12.006

22. Z. Masáková, E. Pelantová and Š. Starosta: *Exchange of three intervals: substitutions and palindromicity*, Eur. J. Combin. 62 (2017), 217-231, DOI: 10.1016/j.ejc.2017.01.003

Preprints

23. K. Klouda, Š. Starosta: *Characterization of circular DoL-systems*, submitted

Conference talks

24. *Palindromes in infinite ternary words*, Words 2009, Salerno, Italy

25. *Generalizations of Sturmian Words*, Joint Mathematical Conference CSASC 2010, Prague, Czech Republic

26. *Θ-palindromes in infinite words*, Analytic and algebraic methods VI 2010, Prague, Czech Republic
27. *Generalizations of Sturmian words*, 10th Nordic Combinatorial Conference (NORCOM 2010), Reykjavik, Iceland
28. *Rauzy triangle*, Analytic and algebraic methods VII 2011, Prague, Czech Republic
29. *Infinite words rich and almost rich in generalized palindromes*, Developments in Language Theory 2011, Milan, Italy
30. *More symmetries occurring in an infinite word*, ČS Grafy 2012 , Litomyšl, Czech Republic
31. *More symmetries occurring in an infinite word: palindromic and G-palindromic defect*, MELA 2012, Telč, Czech Republic
32. *Palindromic richness for languages invariant under more symmetries: results, examples and open questions*, Words 2013, Turku, Finland
33. *Generalized pseudostandard words*, MELA 2013, Telč, Czech Republic
34. *Interval exchange: return words and palindromicity*, The Sixth Visegrad Conference, Dynamical Systems 2015, Prague, Czech Republic
35. *Interval Exchange Words and the Question of Hof, Knill, and Simon*, Developments in Language Theory 2015, Liverpool, Great Britain
36. *Continued Fractions and Spectra of Certain Operators*, Numeration 2016, Prague, Czech Republic
37. *Number theory and spectral instabilities in metamaterials*, Analytic and algebraic methods in physics 13, 2016, Prague, Czech Republic
38. *On the Zero Defect Conjecture*, 16th Mons Theoretical Computer Science Days, 2016, Liège, Belgium

Science popularization articles

39. E. Pelantová a Š. Starosta: *Nestandardní zápisy čísel*, Pokroky matematiky, fyziky a astronomie. 2011, roč. 56, č. 4, pp. 276–289
40. E. Pelantová a Š. Starosta: *Chvála struktur*, Rozhledy matematicko-fyzikální 90 (2015)
41. T. Kalvoda a Š. Starosta: *Počítáme otevřeně se* `SageMath`, Pokroky matematiky, fyziky a astronomie. 2015, roč. 60, č. 4, pp. 300–313

Grants

2013 – 2015 head investigator of 3-year postdoctoral research project of Czech Science Foundation (GA ČR) entitled *Algoritmy pro cirkulární morfismy a jejich pevné body (Algorithms for circular morphisms and their fixed points)*

2010, 2011 head investigator of student's grant SGS CTU in Prague entitled *Kombinatorické a algebraické aspekty nestandardních číselných systémů (Combinatorial and algebraic aspects of nonstandard numeration systems)*

Conferences

2016 *Numeration 2016*, Prague, Czech Republic
member of organizing committee

Sage Days 72, Prague, Czech Republic
main organizer

2013 *Česko-Slovenská MELA – Meeting on Languages*, Telč, Czech Republic
member of organizing committee

2011 *Words 2011*, Prague, Czech Republic
member of organizing committee

Honors and Awards

2013 received award *Cena rektora za vynikající doktorskou práci za rok 2012 - I. stupeň (Rector's award for an excellent doctoral thesis in 2012 - I. class)*

2012 received award *Cena Josefa Hlávky pro nejlepší studenty a absolventy (Josef Hlávka's Award for best students and graduates)*

Supervised student projects

Master's theses

defended	student	topic
2015	Kateřina Pastirčáková	*Substitutivita a generování slov kódujících výměnu 3 intervalů (Subsitutivity and generation of words coding 3 interval exchange)*
2015	Lenka Čačková	*Algoritmy generující bispeciální faktory v DoL systémech (Algorithms generating bispecial factors in DoL systems)*
2016	Jan Legerský	*Construction of algorithms for parallel addition in nonstandard numeration systems*

Bachelor's theses

defended	student	topic
2013	Kateřina Pastirčáková	*Spektra pisotovských čísel a jejich invariance na substituci* (*Spectra of Pisot numbers and their invariance under substitution*) awarded 1st place in SVOČ 2014
2014	Jan Danihelka	*Algoritmy hledání optimální cesty na 2D mřížce* (*Algorithms for optimal path finding on 2D grid*)
2015	Vojtěch Veselý	*Binární projekce Arnouxových–Rauzyových slov* (*Binary projections of Arnoux–Rauzy words*) awarded 3rd place in SVOČ 2016
2016	Matúš Gura	*Algorithms for Combinatorics on Words Related to Palindromic Richness*
2016	Hana Dlouhá	*Periody řetězových zlomků prvků kvadratického tělesa* (*Periods of continued fractions of quadratic fields elements*)
2016	Miroslav Kovář	*Implementation of algebraic operations with continued fractions in SageMath*

Teaching activities

2015/2017	lecture and tutorial for *Matematika pro znalostní inženýrství (Mathematics for Knowledge Engineering)* at FIT CTU in Prague
2014/2017	lecture and tutorial for *Matematika pro kryptologii (Mathematics for Cryptology)* at FIT CTU in Prague
2011/2016	lecture and tutorial for *Matematika pro informatiku (Mathematics for Informatics)* at FIT CTU in Prague (in Czech and English)